REPORT

AICTE SPONSORED ONE WEEK
SHORT TERM TRAINING
PROGRAM

"Deep Learning, Machine Learning and Pattern Recognition"

24th to 29th NOV. 2019

Organized by

Department of Electronics and Communication Engineering
(Re-Accredited by National Board of Accreditation, New Delhi for 3 years w.e.f. July, 2019.)
Sarvajanik College of Engineering and Technology
Sarvajanik Education Society

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Dr. VivakshaJariwala

SPEAKERS

- Dr. ArnavBhavsar, IIT Mandi
- Dr. AshishPhophalia, IIIT Vadodara
- Dr. Priyanka Sharma, Nirma University
- Dr. Sridhar Swaminathan, Bennett University
- Dr. ChiragPaunwala, SCET Surat
- Dr. Maulin Joshi, SCET Surat

PROGRAM OBJECTIVE

As per the mission of Government of India, development of smart cities and villages, Digital India etc. are the need of a day.

This training program mainly focused on the techniques of computer vision, pattern recognition, machine learning and deep learning. It was aimed to train the faculties to directive their students/researchers to fulfill the mission of government.

The training program aimed to provide exposure to:

- Introduction of basic concepts of pattern recognition, machine learning and deep learning.
- Introduction to ANN and CNN.
- Deep learning for multiple data types.
- Deep learning using CUDA.
- Pattern recognition applications using deep learning techniques and Tensor flow.

PROGRAM SCHEDULE

Sarvajanik Education Society

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Program Schedule

Date and Day	Time Slots							
	8.30 AM–9.00 AM	9.00 AM–11.00 AM	11.00 AM-11.15 AM	11.15 AM–12.45 PM	12.45 PM–1:30 PM	1:30 PM– 3.00 PM	3.00 PM–3.15 PM	3.15 PM–4.45 PM
11/24/2019 Sunday	Registration and Breakfast	Speaker: Prof. Arnav Bhavsar (IIT Mandi)	Tea Break	Speaker: Prof. Arnav Bhavsar (IIT Mandi)	Lunch Break	Speaker: Prof. Arnav Bhavsar (IIT Mandi)	Tea Break	Speaker: Prof. Arnav Bhavsar (IIT Mandi)
		Talk: DL and CNN basics (classification)		Talk: CNN based Object Detection		Talk: Siamese Networks		Talk: Auto-encoders and their applications
11/25/2019 Monday		Speaker: Prof. Arnav Bhavsar (IIT Mandi)		Speaker: Prof. Arnav Bhavsar (IIT Mandi)		Speaker: Prof. Maulin Joshi (SCET, Surat)		Speaker: Prof. Chirag Paunwala (SCET, Surat)
		Talk: Generative Adversial Networks-1		Talk: Generative Adversial Networks-2		Talk: Heuristics to improve learning+Hybrid network example		Talk: Importance of One shot learning for Facenet
11/26/2019 Tuesday		Speaker: Prof. Sridhar Swaminathan (Bennett University)		Speaker: Prof. Sridhar Swaminathan (Bennett University)		Speaker: Prof. Sridhar Swaminathan (Bennett University)		Speaker: Prof. Sridhar Swaminathan (Bennett University)
		Talk: Recurrent Neural networks (RNN)		Talk/Hands on session: Applications of RNN		Talk: Unsupervised Learning (Sparse Coding, Restricted Boltzman Machines, Deep Belief Network)		Talk: Variants of Autoencoders (Deep Autoencoder, Discriminative vs Generative Learning Variational Encoder)
11/27/2019 Wednesday		Speaker: Prof. Ashish Phophalia (IIIT Vadodara)		Speaker: Prof. Ashish Phophalia (IIIT Vadodara)		Speaker: Prof. Ashish Phophalia (IIIT Vadodara)		Speaker: Prof. Ashish Phophalia (IIIT Vadodara)
		Talk: Fundamentals of Decision Trees and Random Forest-1		Talk: Random Forest-2		Talk: Random Forest Application to Medical Imaging and Hyperspectral Imaging		Exam session:3:15 PM to 3:45 PM Hands on session: Implementation of Random Forest
11/28/2019 Thursday		Speaker: Prof. Priyanka Sharma (Nirma University)		Speaker: Prof. Priyanka Sharma (Nirma University)		Speaker: Prof. Priyanka Sharma (Nirma University)		Speaker: Prof. Priyanka Sharma (Nirma University)
		Talk: Introduction to Deep Learning Concepts, Hyper Parameter Tuning		Hands on session: NVIDIA DIGITS for deep learning		Talk/Hands on session: Creating a Model, training and deployment, Improving performance		Hands on session: Image Classification using DIGITS, Object detection
11/29/2019 Friday		Speaker: Prof. Priyanka Sharma (Nirma University)		Speaker: Prof. Priyanka Sharma (Nirma University)		Speaker: Prof. Priyanka Sharma (Nirma University)		Speaker: Prof. Priyanka Sharma (Nirma University)
		Talk/Hands on session: Accelerated computing with CUDA C/C++, GPU vs CPU		Talk/Hand on session: Writing Programs in CUDA, memory allocation,		Talk/ Hands on session on NVIDIA command Line Profiler (nprof) and NVIDIA Visual Profiler		Talk/Hands on session: Streaming Multiprocess, Unified Memory, Memory Prefetching Certificate Distribution
Note:	All Technical sessions will be in EC AV Room SCET and Laboratory sessions will be in IT Phase-I Computer Lab							
	Breakfast and Lunch will be in SCET Canteen							

SPEAKER PROFILE

[1] Dr. ArnavBhavsar (IIT Mandi)

He pursued his PhD form IIT Madras and was also a Postdoctoral fellow at GE Global research, Bangalore 2011-2012 and Postdoctoral research associate, Univ. North Carolina, Chapel Hill, 2012-2013.

He is currently working as an Assistant Prof. at IIT Mandi and is a part of the Multimedia Analytics Networks and Systems (MANAS) Lab at IIT Mandi, focusing on various academic and some industry research projects. His areas of interest include Biomedical Image and Signal Analysis, Computer Vision, Machine learning. He has also received 5-year DST Inspire Research Grant in 2014. He has several publication sin reputed International Journals and conferences and has also served as a reviewer in well-reputed Int. conferences / journals on image analysis, machine learning and medimage.

[2] Dr. Sridhar Swaminathan (Bennett University Noida)

Dr. Sridhar Swaminathan is an Assistant Professor in the Department of Computer Science Engineering, Bennett University, India. He is Project Manager for the Leading India AI Project and also NVIDIA DLI Ambassador. Formerly, he worked as a Post-Doctoral Fellow in Bennett University and worked as a Research Officer in the Multimedia University, Malaysia. His research interests are on Computer Vision, Deep Learning and Natural Language Processing.

[3] Dr. AshishPhophalia (IIIT Vadodara)

He is currently working as an Assistant Professor in Indian Institute of Information Technology Vadodara since 2016. Prior to that, he completed his PhD and M.Tech. Degree from DAIICT, Gandhinagar in year 2016 and 2010 respectively. He has received Best Paper Award in National Conference on Future Trends in Information and Communication Technology and Applications (NCICT), 2011. He has been associated with various journals, conferences and symposiums in capacity of author, reviewer or organizer. He is also associated with IEEE Gujarat Section as its treasurer since last three years. His research interest includes Image Processing, Pattern Recognition, Medical Image Analysis.

[4] Dr. Priyanka Sharma (NVIDIA DLI AMBASSADOR and NIRMA UNIVERSITY)

Dr. Priyanka Sharma is working as a Professor at Department of Computer Science and Engineering, Nirma University. She is a Certified NVIDIA DLI Ambassador and specializes in Deep Learning for Computer Vision and Multiple Data Types. An academician by passion and a researcher in the domain of AI and Deep Learning; Dr Sharma has a professional experience of over 19 years, that foothold both Academia and Industry. She has been actively involved on various national and international project collaborations supported by Shastri Indo-Canadian Research Grants, Board of Research in Fusion Research (Department of Atomic Energy), GUJCOST and Vishvesvaraya PhD Scheme. She has also worked as the Principal Investigator of NVIDIA Research Center and NVIDIA Teaching Center at Nirma

University. Dr. Sharma is currently working with RUSA- Government of Maharashtra for designing a broad base curriculum for AI and Deep Learning for the professional colleges of Maharashtra. She is also involved as an Adviser/Member at various other Academic Administration and Research bodies at Nirma University as well as other reputed Universities. She has jointly received the CCI Technology Award (2015) (State Level) and FICCI Award for Best University in the Use of technology (2015) (National Level), on behalf of Nirma University. One of her research project also received Best Project Award at CSI Project Innovations at National Level.

[5] Dr. ChiragPaunwala (SCET Surat)

Dr. ChiragPaunwala is Professor in the department of Electronics and Communication Engineering at Sarvajanik college of Engineering and Technology, Surat. He is also serving as Dean R&D, SCET, Surat. He has completed his Ph.D. in Electronics Engineering from S.V. National Institute of Technology – Surat in year 2012. His research interest lies in the area of Signal/Image Processing ranging from Software simulation to hardware implementation. At present, he is working on Multi-Biometric Fusion system, Image Inpainting, Content-Based Image Retrieval, Real time object detection, and identification. He has served as a reviewer in IEEE Access, Elsevier Journal of Engineering Applications of Artificial Intelligence, Defence Technology as well as in Signal Processing. He had also served as a reviewer at various national and international conferences. He has organized various programs in the field of Image Processing and OpenCv. He has published more than 40 papers including peer reviewed international journals and conferences. Presently six PhD students are registered under him. He has guided more than 20 PG researchers till date. He is in the panel of expert faculties of IEEE Gujarat Section.

Currently, He is associated with IEEE SPS, USA as Chapter Chair Coordinator as well as Chapter Coordinator for IEEE Gujarat Section. Recently, he has received a meritorious service and leadership award by IEEE Signal Processing Society, USA. He has also received the leadership award for year 2014 by IEEE Signal processing Society. IEEE SPS Chapter Gujarat Section received "Chapter of the year" in year 2015 and 2016 under his able leadership as a Chairman. He has fetched following grants (1) GUJCOST worth of 2.05 lakhs and (2) NVidia, USA for GPU (3) AICTE for organizing STTP.

[6] Dr. Maulin Joshi (SCET Surat)

Dr. Maulin Joshi is currently working as a Professor and Head, Electronics and Communication Engineering Department, Sarvajanik College of Engineering and Technology,Surat. He has completed his PhD from SVNIT Surat in 2012 and MTech from IIT Bombay in 2005. He has 21 years of experience in academics and 1 year in industry. He has several PhD scholars and ME students under him for research work.

He is currently a Technical Activity Chair and Excom member of IEEE Gujarat Section. He is also aSenior member of IEEE and Past Chair, Student Activity, IEEE, Gujarat Section (2015). He has also served as aJoint Secretary IEEE, Gujarat Section (2013 and 2014),

Secretary, Solid state Devices chapter IEEE, Gujarat Section (2014, 2015) and Foundermember of IEEE SCET SB, branch counselor (2009- 2013).He is also associated with Computer society of India (CSI) as a Nomination committee chair, Surat chapter (2017-present) and with Institute Of Electronics and Telecommunication engineers (Fellow -IETE) as a Chairman, IETE Surat Sub center (2018-20).

He has several publications in recognized International Journals and Conferences. His area of interests include Neural network and fuzzy systems based signal processing, Adaptive signal processing, machine learning and deep learning.

Day 1 Inaugural Date: 24 Nov 2019

Day 1 Session by Dr. ArnavBhavsar (IIT Mandi) Date: 24 Nov 2019

He started with his session on basics of deep learning techniques. Convolutional networks such as ALEXNET, VGG-NET, LE-NET, etc. used for classification problems and object detection were taught. Then the basics about Siamese networks and their applications were taken on and lastly Auto encoders to generate the objects were explained.

Day 2 Session by Dr. ArnavBhavsar (IIT Mandi) Date: 25 Nov 2019

He delivered his talk on Adversial networks such as GAN and their applications in detail in this session.


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Architecture and Loss Function
SHETH C.N. FACULTY OF E&C DEPTT

Day 2 Session by Dr. Maulin Joshi (SCET Surat) Date: 25 Nov 2019

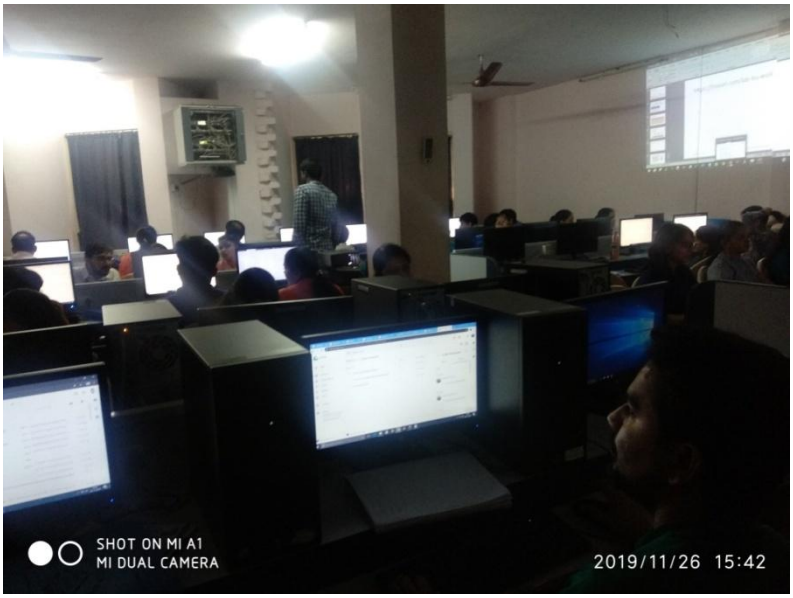
He delivered his talk on basics of neural networks. He also taught techniques for weight updationand error minimization for optimized networks.

Day 2 Session by Dr. ChiragPaunwala (SCET Surat) Date: 25 Nov 2019

He delivered his talk on basics of FACENET. The applications related to FACENET that can be used in surveillance and forensic domain was covered. The concept of triplet loss was explained well.

Day 3 Session by Dr. Sridhar Swaminathan (Bennett University Noida) Date: 26 Nov 2019

He delivered his talk on basics of deep learning techniques along with hands on session. He also explained in detail RNN and their applications practically as well as covered concepts of Auto-encoders in detail.



Day 4Session by Dr. AshishPhophalia (IIIT Vadodara) Date: 27 Nov 2019

He delivered his talk on Random forest technique for machine learning domain. The applications of decision tree and random forest techniques were covered practically in terms of medical image analysis and hyperspectral imaging.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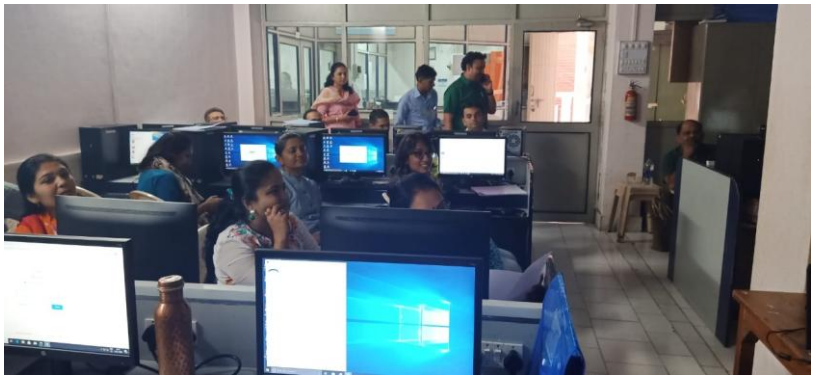
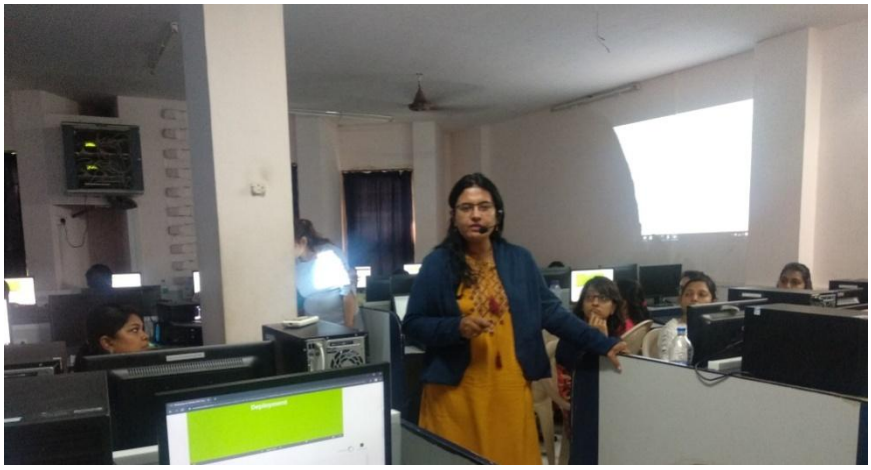
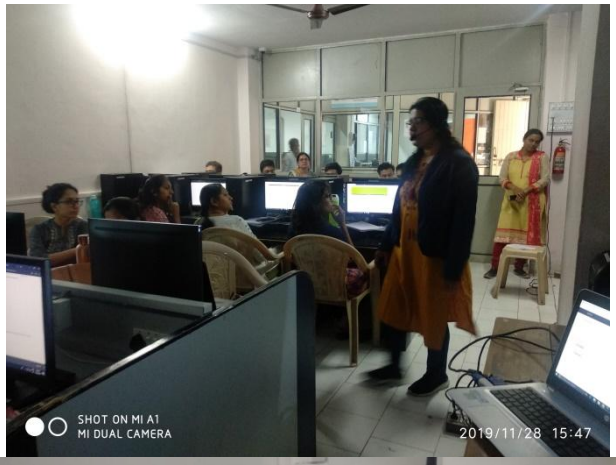
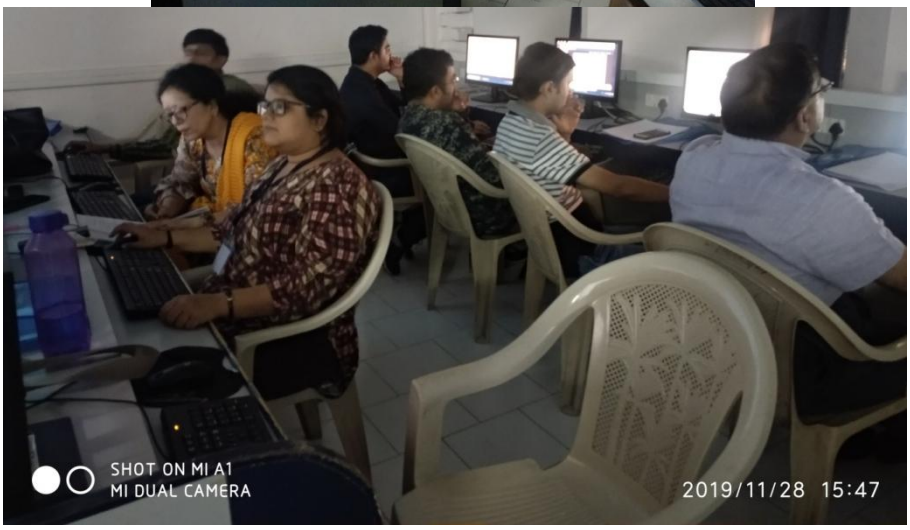


Day 5 and 6 Session by Dr. Priyanka Sharma (NVIDIA DLI AMBASSADOR and NIRMA UNIVERSITY Ahmedabad) Date: 28-29 Nov 2019

She started with the basics of deep learning course with NVIDIA resources. She explained the stages of developing deep learning networks in CUDA environment along-with live practical sessions. She explained the DIGITS environment, NVIDIA compiler and storage computation facilities.







Day 6 Valedictory Session Date: 29 Nov 2019

*********End of STTP*********